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ABSTRACT

One of the most critical elements in the adaptation of productivity analysis to education is the adequacy of the instruments for measuring program output or achievement. Various aspects of standardized test construction make them less than desirable measures of productivity. The Test Development Notebook which the New York State Department of Education is currently developing may offer a needed alternative to standardized testing. The overall purpose of the notebook is to provide sufficient numbers of test items at various levels of difficulty so that reading development at a given level may be monitored periodically with the administration of a series of comparable test forms. The starting point for the notebook has been literal comprehension, and the work in process has two emphases: one is applying the cloze technique in testing literal comprehension; the other is systematizing the writing of multiple-choice items for literal comprehension by specifying the type of questions to be asked and establishing rules for writing them. Both approaches use readability formulas to identify the difficulty of the material. Both stress objectivity and the elimination of writer bias. (Author/RC)

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# Resources for the Implementation of a Productivity Analysis in Education

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A paper presented at a symposium entitled "Productivity in Reading Programs" held during the annual meeting of the American Educational Research Association, Washington, D.C. from March 31, 1975 to April 3, 1975. Session 7.16

The initial purpose of this paper was to describe the various materials and methods used in the pilot study of productivity in reading programs.

Preceding papers in this symposium have given considerable information on the instruments used for gathering data on the inputs, throughputs, and outputs of the pilot study. These instruments included (1) the schedules for the hour-long, taped interviews with principals, teachers, reading specialists, and aides; (2) the forms for collecting data from the school records of participating students; and (3) the tests, standardized and criterion-referenced, used to assess achievement or output. This paper will, therefore, concentrate on the efforts to improve measures for the assessment of outcomes and will describe the work under way on the Test Development Notebook.

One of the most critical elements in the adaptation of productivity analysis to education is the adequacy of the instruments for measuring program output or achievement. While many of the results reported in this symposium on productivity in reading are based on standardized test scores, there is some question about the suitability of these measures. Various aspects of standardized test construction make them less than desirable measures of productivity. For example, wide ranges of difficulty are covered by a single test, and items which may test the primary goals of the reading program but do not discriminate among pupils to produce the necessary distribution of scores, are usually excluded. Moreover, because test writing practices indicate a high degree of subjectivity in the selection of test content and in the writing of reading test items, there is no assurance that the standardized test is an

adequate representation of the domain of reading.

The Test Development Notebook which the New York State Education Department is currently developing may offer the needed alternative to standardized testing. This work is an outgrowth of the development of the criterion-referenced CAM tests for the pilot phase of the productivity study. The overall purpose of the notebook is to provide sufficient numbers of test items at various levels of difficulty so that reading development at a given level may be monitored periodically with the administration of a series of comparable test forms.

The Notebook in its final form will be a set of master copies of test items on various aspects of reading that can be assembled in a variety of ways and then reproduced in quantity to meet local needs and local test specifications. The starting point for the notebook has been literal comprehension, and the work in process has two emphases: one is applying the Cloze Technique in testing literal comprehension; the other is systematizing the writing of multiple-choice items for literal comprehension by specifying the types of questions to be asked and establishing rules for writing them. Both approaches use readability formulas to identify the difficulty of the material. Both stress objectivity and the elimination of writer bias.

## Readability Scores and Difficulty Levels

One need in reading assessment, and in reading instruction as well, is to have material at an appropriate level of difficulty. For assessment purposes, multiple passages of comparable difficulty are required so that progress may be measured at a given level.

The perfect readability formula accounting for all possible variables has yet to be devised, but existing formulas do permit one to rank reading

materials on their "difficulty" as defined by the formula used.

The readability formulas used for the Test Development Notebook are the Spache (1953, 1960) and the Dale-Chall (1948). The Spache is normally used for grades 1 through 3, the Dale-Chall for grades 4 through 12 and college. Both formulas use average sentence length and percent of "hard words" in figuring difficulty. "Hard words" are those not appearing on lists of familiar words. The word list for the Spache formula is "Clarence Stone's Revision of the Dale List of 796 Easy Words "; for the Dale-Chall formula it is the "Dale List of 3000 Familiar Words." The criteria for difficulty used in devising both formulas were graded reading materials. The Spache formula produces grade level scores. The Dale-Chall formula produces raw scores interpreted as "corrected grade levels." The corrected grade level for a raw score of 5.0 to 5.9 on the Dale-Chall, for example, is 5th to 6th grade.

For the Test Development Notebook, the range of Spache scores was divided into 6 equal intervals, and the range of Dale-Chall scores was divided into 22 equal intervals. This gave 28 difficulty levels covering grades 1 through college. The raw scores, difficulty levels, and original grade level interpretations are shown in Table 1.

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Insert Table 1 about here

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## Applying the Cloze Technique in Testing Literal Comprehension

The cloze technique--the systematic deletion of words from prose passages and their subsequent replacement by the testee--is best known as a means of determining the readability of written material for specific pupils. It has been found (Bormuth, 1971) that students must attain a certain proportion of correct completions (35%-50%) if the material from which a clozed passage is taken is to be useful to them in instruction. It has also been found (Bormuth, 1967) that scores on the cloze test correlate positively with gain scores on tests given before and after the reading of a passage.

Some theorists regard information gain as the most acceptable operational definition of literal reading comprehension. If one accepts information gain as a sound indicator of comprehension, the cloze technique may be a quick and economical way of measuring comprehension. Accordingly, cloze items are incorporated in the Test Development Notebook for two purposes: (1) to provide a method of determining pupils' reading levels, and (2) to assess literal comprehension.

In its most common form, the cloze technique calls for the student to supply the deleted words: in the Test Development Notebook, cloze passages will be followed by multiple choice responses suitable for machine scoring.

### Selection of Cloze Passages

In order to eliminate the possibility of content bias and to assure that the cloze tests would reflect the materials students read in instructional programs and elsewhere, a plan was devised for random sampling of four domains:

1. Textual Material in Reading, Language, Arts, Social Studies, Science, and Mathematics

2. Citizen Material, i.e., newspapers and news magazines

3. Consumer Material (catalogs, advertising, instructions, and so forth)

4. Reference Materials (test instructions, children's magazines, encyclopedias, and so forth)

The sources of these materials were the New York State Education Department's Curriculum laboratory and the State Library. Some consumer passages were taken from The Assessment of Student Literacy (Hanson and Hesse, 1974) used in the Madison, Wisconsin, Public Schools.

The samples taken were examined to locate coherent passages of specified lengths appropriate for clozing. Readability scores were then calculated and the passages assigned to grade levels.

Originally the cloze passages were to be grouped by difficulty levels without reference to grade levels. However, the range of difficulty in textual material for any one grade was so great that grade level groupings for cloze passages were adopted as more useful to teachers. In the textual domain, the number of difficulty levels per grade level varies. In the three other domains, grade levels are limited to two difficulty levels.

The selection procedures produced 1,374 passages for cloze testing. Their distribution by domain and grade level is shown in Table 2. Table 2 also shows the distribution of the textual materials by subject matter. Each cloze passage has a code number giving its grade level, difficulty level, material domain, and any subcategories to which it belongs.

Preparation of Cloze Items

The procedure for word deletion in the cloze passages varied with grade. For grades 1 and 2 every 8th word was deleted. Deletions were limited

to nouns and verbs. For grade 3 and above, every 5th word was deleted. Deletions included adverbs and adjectives as well as nouns and verbs.

In all cases the initial deletion was made between the 6th and the 10th words. The exact starting point was determined by a table of random numbers. The number of deletions per passage was fixed by the passage length which varied by grade level. The number of alternatives in the multiple-choice responses also varied by grade level: three alternatives at grade 1, four at grade 2, and five at grade 3 and above. These variations by grade level are summarized in Table 3, Specifications for Cloze Passages and Test Items.

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Insert Table 3 about here

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The correct multiple-choice response to a cloze item is the exact word deleted from the passage. To assure distractors of appropriate difficulty for the test items, graded lists of nouns, verbs, adverbs, and adjectives were prepared using Harris and Jacobson's Basic Elementary Reading Vocabularies (1972) and EDL Research and Information Bulletin 5: A Revised Core Vocabulary (Taylor, Frackenpohl, and White, 1969). Special content lists for subject matter areas were compiled using the Harris-Jacobson material and the American Heritage Word Frequency Book (Carroll, Davies, and Richman, 1971).

Initially, distractors were selected from appropriate lists by use of a table of random numbers. Later, a computer program was written for automatic random selection of distractors. Each set of distractors was reviewed to eliminate tricky or ineffective distractors, such as synonyms, and to assure that the distractors agreed with the stem in tense, number, and so forth.

With a minimum of 3 deletions per passage at grade 1 and a maximum of 10 deletions per passage at grade 4 and above, nearly 13,000 multiple-choice items have been prepared for the cloze section of the Test Development Notebook. Their distribution by domain is shown in Table 4.

Insert Table 4 about here

Format

All cloze passages and test items have been put in a comparable format. The format gives (1) the identification number of the passage, (2) a title (provided by the item writer), (3) the passage itself, and (4) the test items. Large (Bulletin) type is used for the first two grades. Grade 1 passages appear two to a page. At all other grade levels, each passage and its items appear on a separate page. The test items are not numbered so that teachers may assemble the pages in different ways for different tests and then number the items consecutively. Sample cloze pages for grades 1 and 4 are shown in Figures 1 and 2.

Insert Figures 1 & 2 about here

Future Work

Plans have been made to extend the cloze material in the textual domain through college and to expand the number of passages for the citizen, consumer, and reference domains.

In the meantime, the completed test items are already in use on a trial basis. Users are well aware that this application of the cloze as a measure of literal comprehension is experimental. Various internal analyses and comparisons with other tests must be made to determine its utility and validity. Some of these analyses will examine the use of the multiple-choice format for a cloze test.

## Systematizing the Writing of Multiple-Choice Items

Multiple-choice items based on given selections are probably the most commonly used means of assessing comprehension in school reading programs. Systematizing the writing of multiple-choice items for the Test Development Notebook is intended to minimize the idiosyncracies and biases of individual item writers, and to maximize the comparability of items for the same skills or objectives. With more comparable items one can better trace students' progress at a given level and from level to level.

The systematization process -- specifying types of questions and rules for writing them -- may eventually be extended to all aspects of comprehension. The work nearing completion at this time is focused on literal comprehension and, more specifically, on main ideas and details. The definition of literal comprehension used for the Test Development Notebook is the ability to identify or recognize exactly what is said in written material. This may be regarded by some as too simple a definition of comprehension, but accuracy in knowing what has been stated is fundamental to any interpretation of the material.

The work on the multiple-choice items has had two phases. The first involved the preparation of over 300 passages meeting specified requirements, the second the actual writing of main idea and detail questions for each passage.

### Passage Preparation

The design for the literal comprehension section of the Test Development Notebook called for 15 passages for each of the first 20 difficulty levels established from the Spache and Dale-Chall formulas. The lengths of the passages were to vary by level. The specified passage lengths and the readability scores for all 20 levels are shown in Table 5. Additional specifications

Insert Table 5 about here

concerned the unity of each passage, its utility as a source for main idea and detail questions, and its suitability in content, style, and vocabulary for the pupils with whom it would normally be used. The vocabulary of the passages was controlled to a great extent by the word lists of the readability formulas. Vocabulary was further controlled by the use of Harris and Jacobson's (1972) basal-reader or "core" word lists for levels 1-12 (grades 1-6) and the American Heritage Word Frequency Book (1974) for levels 13-20. These references served as guides for determining the acceptability of individual words in passages and in item responses.

Passage material was taken from existing criterion-referenced tests (the Duval County, Florida, tests for Individually Paced Instruction in Reading and the CAM tests used in the pilot phase of the study) and from a variety of books, magazines, and newspapers. A substantial amount of new material was written. Existing test passages were edited extensively to meet the passage specifications. Modifications in excerpts from books, magazines, and newspapers were limited to a few individual word changes to meet the vocabulary requirements of the readability formulas. An effort was made to have a balance of fictional and non-fictional passages and to have diversity of subject matter within these broad categories. Fiction was given greater weight at the lower levels. The final distribution of the passages by topic and level is shown in Table 6.

Insert Table 6 about here

Item Writing

In systematizing the actual writing of test items, 12 different types of queptions were identified: 4 for main idea and 8 for details.

Main idea questions. Main idea questions concerned titles (often used as devices for teaching main ideas) and main ideas themselves. For the purpose of item-writing, a title was defined as a noun or noun with modifiers which expresses the subject or topic of a passage. A main idea was defined as a complete sentence incorporating the essential point or points of a passage. Two types of title and main idea items were written: (1) verbatim items with the correct responses and the distractors taken directly from the passage, without change, and (2) derived items that used the vocabulary of the passage for the correct response and distractors but modified word order, added words, and consolidated material as needed. The derived items were to adhere to the literal meaning of the passages and to avoid inference or abstraction.

Verbatim and derived items have identical stems. The exact wording of the stems and the number of alternatives vary with the level of the passage as shown in Table 7.

Insert Table 7 about here

While standardized in format, the title and main idea questions do rely heavily on writer judgement for determining the title and main idea.

Detail questions. The eight detail questions were suggested by Bormuth's work On the Theory of Achievement Test Items (1970). Bormuth identifies 8 wh-transformations capable of covering the entire lexical content of a sentence. The "pro" or substitution elements which can transform a statement into a question are how, what (for a noun or pronoun), what (for a verb), which, who, when, where, and why. These are, of course, the question words teachers commonly use to direct attention to the details of reading material.

Bormuth proposed that for test construction purposes, a pool of items be developed by writing all possible wh-items on a sentence and on all possible transformations of and derivations from that sentence. An individual test would be created by random selection of items from such a pool. The ability to handle all transformations and derivations is beyond the scope of the literal comprehension section of the Test Development Notebook, but the wh-substitutions established the pattern for the detail questions.

Detail questions for a given passage were written as follows:

1. A permutation table for numbers 1 through 16 was used to take sentences from a passage in random order.

2. Where possible, a how question was written on the first sentence taken, a what (noun) question on the second sentence, a what (verb) question on the third sentence, and so forth through the entire list of wh-transformations.

3. If the first sentence was not appropriate for a how question, its utility for each succeeding wh question was examined, and an appropriate wh item written.

4. Each randomly selected sentence was treated in the same manner until one test item was written for as many of the wh questions as possible. If necessary, a single sentence was used for more than one question.

The eight different detail or wh-questions are listed in Table 8 with sample sentences, questions, and responses.

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Insert Table 8 about here

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The rules for question-writing were:

1. Be clear and concise.

2. Use colloquial English.

3. Change the portion of the sentence appearing in the question as little as possible.

4. Replace pronouns with their referents.

5. Avoid negative questions

6. Always start the question with the "pro" element, i.e., how, what, and so forth.

The rules for writing responses were:

1. Take the correct response verbatim from the passage.

2. Make all distractors grammatically, semantically, and logically plausible.

3. Have distractors parallel in length and construction.

4. Do not include distractors that could be considered correct on the basis of other sentences in the passage.

5. Take distractors from the passage wherever possible, modifying wording to meet the preceding qualifications.

6. Make up distractors only when necessary, and have them conform to the preceding qualifications (2, 3, and 4 above).

The overriding criterion for every item was that it be impossible to answer without reading the passage.

The rules for item-writing automatically excluded questions on negative statements, questions, imperative statements, sentence fragments, ellipses,

and many instances of anaphora (the use of a grammatical substitute for a preceding word or group of words). Long compound sentences, predicate adjectives, and passive constructions were difficult to handle because they often produced unduly complex, awkward, or uncolloquial questions. One question that was consistently avoided as uncolloquial was the who question based on a sentence with a plural subject and a present tense verb. Transforming "The men say the bridge is out," to "Who say the bridge is out?" was not considered acceptable.

The limiting effects of the rules were most apparent with upper level passages where longer sentences, more complex ideas and complicated sentence structure, ellipsis, and anaphora were most likely to occur. On the other hand, passages at the lowest difficulty levels often were too brief or devoid of modifiers to produce the full array of wh questions.

With eight wh questions plus the four main idea and title questions, the maximum number of items that could have been written for the 300 passages was 3,600. Because all questions could not be asked on every passage, the number produced was closer to 3000. Figures 3 and 4 are examples of final products for levels 2 and 9.

Insert Figures 3 & 4 about here

Future Work: The literal comprehension questions will be field tested this spring along with the cloze items.

The multiple-choice materials will be subject to much scrutiny with an effort made to ascertain pupil and teacher reaction to both the passages and the questions. One indicator of the effectiveness of the passage preparation and item writing procedures will be what passages and questions are chosen for use. Comparisons of scores on different passages from the same level may give some indication of the efficacy of readability formulas for producing passages of comparable difficulty. Test results for the these literal comprehension, multiple-choice items will also be compared with results on the cloze tests and standardized tests.

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Table 1

Difficulty Levels for Test Development Notebook

| Readability Formula | Raw Score | Difficulty Level | Original Grade Level Assignment |
|---|---|---|---|
| S | 1. 0 - 1. 4 | 1 | |
| P | 1. 5 - 1. 9 | 2 | 1 |
| A | 2. 0 - 2. 4 | 3 | |
| C | 2. 5 - 2. 9 | 4 | 2 |
| H | 3. 0 - 3. 4 | 5 | |
| E | 3. 5 - 3. 9 | 6 | 3 |
| | 4.50 - 4.74 | 7 | |
| D | 4.75 - 4.99 | 8 | 4 |
| A | 5.00 - 5.24 | 9 | |
| L | 5.25 - 5.49 | 10 | |
| E | 5.50 - 5.74 | 11 | 5-6 |
| I | 5.75 - 5.99 | 12 | |
| C | 6.00 - 6.24 | 13 | |
| H | 6.25 - 6.49 | 14 | |
| A | 6.50 - 6.74 | 15 | 7-8 |
| L | 6.75 - 6.99 | 16 | |
| L | 7.00 - 7.24 | 17 | |
| | 7.25 - 7.49 | 18 | |
| | 7.50 - 7.74 | 19 | 9-10 |
| | 7.75 - 7.99 | 20 | |
| | 8.00 - 8.24 | 21 | |
| | 8.25 - 8.49 | 22 | |
| | 8.50 - 8.74 | 23 | 11-12 |
| | 8.75 - 8.99 | 24 | |
| | 9.00 - 9.29 | 25 | |
| | 9.25 - 9.49 | 26 | 13-15 |
| | 9.50 - 9.74 | 27 | (College) |
| | 9.75 - 9.99 | 28 | |

Table 2

Passages for Cloze Testing

| Grade | Domain | | | | | | | | | Grand Total |
|---|---|---|---|---|---|---|---|---|---|---|
| | Textual | | | | | | Citizen | Consumer | Reference | |
| | Reading | Lan. Arts | Math. | Sci. | Soc. St. | Total | | | | |
| 1 | 48 | | | | 30 | 78 | | | | 78 |
| 2 | 40 | | | | 30 | 70 | | | | 70 |
| 3 | 30 | 20 | 20 | 20 | 20 | 110 | | | 10 | 120 |
| 4 | 42 | 20 | 20 | 20 | 20 | 122 | | | 9 | 131 |
| 5 | 37 | 20 | 20 | 20 | 20 | 117 | | | 10 | 127 |
| 6 | 33 | 20 | 20 | 20 | 20 | 113 | | 8 | 12 | 133 |
| 7 | 30 | 20 | 20 | 20 | 20 | 110 | 6 | 9 | 11 | 136 |
| 8 | 30 | 20 | 20 | 20 | 20 | 110 | 13 | 9 | 10 | 142 |
| 9 | 30 | 20 | 20 | 20 | 20 | 110 | 19 | 15 | 10 | 154 |
| 10 | 34 | 20 | 20 | 20 | 20 | 114 | 17 | 11 | 10 | 152 |
| 11 | | | | | | | 17 | 13 | 8 | 38 |
| 12 | | | | | | | 19 | 13 | 10 | 42 |
| 13 | | | | | | | 16 | 12 | | 28 |
| 14 | | | | | | | 13 | 10 | | 23 |
| Total | 354 | 160 | 160 | 160 | 220 | 1054 | 120 | 100 | 100 | 1374 |

Table 3

Specifications for Cloze Passages and Test Items

| | Grade 1 | Grade 2 | Grade 3 | Grade 4 and Above |
|---|---|---|---|---|
| Passage Length | 25-35 words | 40-45 words | 60-70 words | 60-70 words |
| Words Deleted | Nouns verbs | Nouns verbs | Nouns Adjectives Verbs Adverbs | Nouns Adjectives Verbs Adverbs |
| Frequency of Deletions | Every 8th Word | Every 8th Word | Every 5th Word | Every 5th Word |
| Deletions per Passage | 3 | 5 | 10 | 10 |
| Distractors per Item | 3 | 4 | 5 | 5 |

Table 4

Number of Cloze Passages and Test Items
by Domain

| Cloze | Domain | | | | | | | | | Grand Total |
|---|---|---|---|---|---|---|---|---|---|---|
| | Textual | | | | | | | | | |
| | Reading | Lan. Arts | Math. | Sci. | Soc. St. | Total | Citizen | Consumer | Reference | |
| Passages | 354 | 160 | 160 | 160 | 220 | 1,054 | 120 | 100 | 100 | 1,374 |
| Items | 3,004 | 1,600 | 1,600 | 1,600 | 1,840 | 9,644 | 1,200 | 1,000 | 1,000 | 12,844 |

Figure 1

Sample Cloze Item Level 1

## THE BIRDS AND BEN

Ben comes to see the birds. The _____ fly up. The birds fly down. They _____ to Ben. Ben says, "Fly, birds." The _____ fly up. They fly up high. They fly away.

| | | |
|---|---|---|
| ○ a. paints<br>b. birds<br>c. pigs | ○ a. read<br>b. come<br>c. put | ○ a. men<br>b. browns<br>c. birds |

## DICK WANTS HELP

Dick said, "Come here, Jane. I _____ you. Come and help me."

Sally _____, "Oh, Jane! See Dick and Spot!"

"Here, Dick," said Jane. "I can _____ you."

| | | |
|---|---|---|
| ○ a. name<br>b. surprise<br>c. want | ○ a. had<br>b. said<br>c. raced | ○ a. truck<br>b. help<br>c. picture |

Figure 2

Sample Cloze Item Level 4

JOEY WALKS HOME FROM SCHOOL

Joey had a certain way he walked home from _____. He did not walk up _____ street and down the _____. He had it all _____ out. He could _____ cater-corners across streets. He could _____ from the south-east _____ of this one to the north-west _____ of that one. He _____ that he saved at least one _____ block, by walking home from school this way.

| | | | | | |
|---|---|---|---|---|---|
| ○ | a. insect<br>b. momma<br>c. prairie<br>d. canoe<br>e. school | | ○ | a. doubt<br>b. push<br>c. steal<br>d. walk<br>e. park | |
| ○ | a. weak<br>b. one<br>c. smart<br>d. yellow<br>e. grand | | ○ | a. gathering<br>b. grain<br>c. corner<br>d. ocean<br>e. packet | |
| ○ | a. next<br>b. round<br>c. dumb<br>d. high<br>e. picture | | ○ | a. notice<br>b. jacket<br>c. corner<br>d. instrument<br>e. heading | |
| ○ | a. minded<br>b. alerted<br>c. topped<br>d. figured<br>e. buzzed | | ○ | a. fired<br>b. cracked<br>c. arose<br>d. choked<br>e. knew | |
| ○ | a. mop<br>b. kid<br>c. charge<br>d. yell<br>e. cut | | ○ | a. outer<br>b. faint<br>c. solemn<br>d. homely<br>e. whole | |

Table 5

Length and Readability Score Specifications
for Literal Comprehension Passages

| Level | Words | Readability Score |
|---|---|---|
| 1 | 26 - 35 | 1. 0 - 1.4 |
| 2 | 36 - 45 | 1. 5 - 1.9 |
| 3 | 46 - 55 | 2. 0 - 2.4 |
| 4 | 56 - 65 | 2. 5 - 2.9 |
| 5 | 65 - 75 | 3. 0 - 3.4 |
| 6 | 76 - 85 | 3. 5 - 3.9 |
| 7 | 86 - 95 | 4.50 - 4.74 |
| 8 | 96 - 105 | 4.75 - 4.99 |
| 9 | 106 - 115 | 5.00 - 5.24 |
| 10 | 116 - 125 | 5.25 - 5.49 |
| 11 | 126 - 135 | 5.50 - 5.74 |
| 12 | 136 - 145 | 5.75 - 5.99 |
| 13 | 146 - 155 | 6.00 - 6.24 |
| 14 | 156 - 165 | 6.25 - 6.49 |
| 15 | 166 - 175 | 6.50 - 6.74 |
| 16 | 166 - 175 | 6.75 - 6.99 |
| 17 | 166 - 220* | 7.00 - 7.24 |
| 18 | 166 - 220* | 7.25 - 7.49 |
| 19 | 166 - 220* | 7.50 - 7.74 |
| 20 | 166 - 220* | 7.75 - 7.99 |

* At the four highest levels, the word range was extended in order to have fictional passages with the required readability scores. Non-fictional passages were held to a maximum of 185 words.

Table 6

Distribution of Literal Comprehension Passages by Topic

| Level | Non-Fiction | | | | | | | | Fiction | | | | | | | Total |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | Arts | Biography | History | Social Studies | Science | Recreation | Ideas | Lit. | Adv. | Animal | Family | Humor | Sports | Job | Lit. | |
| 1 | | | | | | | | | 2 | 3 | 4 | | 3 | 3 | | 15 |
| 2 | | | | | | | | | 3 | 5 | 5 | 1 | | 1 | | 15 |
| 3 | | | | | | | | | 6 | 2 | 3 | 2 | 1 | 1 | | 15 |
| 4 | | | | | | | | | 2 | 1 | 6 | 1 | 2 | 3 | | 15 |
| 5 | | | | 2 | 3 | | | | 1 | 3 | 3 | | 2 | 1 | | 15 |
| 6 | | | | 1 | 2 | | | | 4 | 2 | 2 | 1 | 2 | 1 | | 15 |
| 7 | | 1 | 1 | 3 | 2 | | | | 3 | | 2 | 2 | | 1 | | 15 |
| 8 | | | 2 | 3 | 5 | | | | 1 | 2 | 2 | | | | | 15 |
| 9 | 1 | | 4 | 1 | 2 | | | | | 2 | | 2 | 1 | | 2 | 15 |
| 10 | | | 1 | 4 | 6 | | | | 1 | 1 | | 1 | | | 1 | 15 |
| 11 | | | 2 | 2 | 4 | | | | 3 | | | | 1 | 1 | 2 | 15 |
| 12 | | 1 | 1 | 3 | 4 | 1 | | | 1 | | | 1 | 1 | 1 | 1 | 15 |
| 13 | | 2 | 3 | 1 | 5 | 1 | | | 1 | | | | | | 2 | 15 |
| 14 | 1 | | 3 | 2 | 4 | | | | | | | | | 1 | 4 | 15 |
| 15 | | | | 3 | 2 | 1 | | 1 | | | | | | | 8 | 15 |
| 16 | | 1 | 2 | 1 | 4 | 3 | | | | 1 | | | | | 3 | 15 |
| 17 | | 1 | 5 | 3 | | 1 | 1 | 1 | 1 | | | | | | 3 | 16 |
| 18 | 1 | | 3 | 2 | 4 | | 1 | | 1 | | | 1 | | 1 | 4 | 18 |
| 19 | 1 | 1 | | 3 | 2 | | 6 | | 1 | | | | | | 2 | 16 |
| 20 | 1 | | | 2 | 3 | | 6 | 5 | | | | | | | | 17 |
| All | 5 | 7 | 27 | 36 | 52 | 7 | 14 | 7 | 31 | 22 | 27 | 12 | 13 | 15 | 32 | 307 |

Table 7

Title and Main Idea Questions

| Question # | Type | Passage Level | Stem | Alternatives |
|---|---|---|---|---|
| 1 | Title-Verbatim | 1-6 | The best title for this story is | 3 |
| 2 | Title-Derived | 7-20 | The best title for this selection is | 4 |
| 3 | Main Idea-Verbatim | 1-4 | What is this story mostly about? | 3 |
| | | 5-6 | The main idea of this story is | 3 |
| 4 | Main Idea-Derived | 7-20 | The main idea of this selection is | 4 |

Table 8

Wh Questions for Literal Comprehension: Detail

| Question Number | Question Type | Sample Sentence | Sample Question | Sample Response |
|---|---|---|---|---|
| 5 | How | Thirty people went to the show. | How many people went? | 30 |
| | | The tree was very tall. | How tall was the tree? | very tall |
| | | Joan brushed her teeth three times a day. | How often did Joan brush her teeth? | three times a day |
| | | The brook flowed rapidly. | How did the brook flow? | rapidly |
| | | With her tear-stained face, Mary looked sad. | How did Mary look? | sad |
| | | John drives to school. | How does John get to school? | drives |
| 6 | What (noun, pronoun) | The fish swam fast. | What swam fast? | the fish |
| | | John ate lunch at school. | What did John eat? | lunch |
| | | The roll was piping hot. John ate it. | What did John eat? | the roll |
| | | "I need help!" shouted Jim. | What did Jim shout? | "I need help!" |
| 7 | What (verb) | Tim ran all the way home. | What did Tim do? | ran |
| | | Jane sings when she gets up. | What does Jane do? | sings |
| | | Harry was thinking about his homework. | What was Harry doing? | thinking |

(Continued)

Table 8 (Continued)

| Question Number | Question Type | Sample Sentence | Sample Question | Sample Response |
|---|---|---|---|---|
| 8 | When | When the steam inside expanded, the popcorn popped. | When did the popcorn pop? | when the steam inside expanded |
| | | It was 10:00. | What time was it? | 10:00 |
| | | Marty usually played first base. | When did Marty play first base? | usually |
| | | The boys came home in the evening. | When did the boys come home? | in the evening |
| 9 | Where | At Easter time, Linda went to New York. | Where did Linda go? | to New York |
| 10 | Which (also what kind) | It was Tom's cat. | Whose cat was it? | Tom's |
| | | Davy wore a coonskin hat. | Which hat did Davy wear? | coonskin |
| | | She wore a new outfit. | What kind of outfit did she wear? | new |
| | | Bill's shirt was red. | What color was Bill's shirt? | red |
| 11 | Who | Herbie played ball every day. | Who played ball? | Herbie |
| | | The car hit Mary. | Who did the car hit? | Mary |
| 12 | Why | Tom tripped because his shoes were too big. | Why did Tom trip? | because his shoes were big |
| | | The sun got very hot, and the ice melted. | Why did the ice melt? | The sun got very hot. |

Figure 3

Literal Comprehension Passage
and Items for Level 2

A big brown dog lives next door to Bruce. His name is Sparky. He barks a lot. Every time Bruce comes near, Sparky barks. His bark is very loud. Bruce does not like to go near the big dog.

1. The best title for this story is

x a) Sparky
b) ~~Bruce~~ Time
c) Next Door

2. The best title for this story is

a) A Big Brown Dog
x b) Bruce and Sparky
c) Bruce and the Bark

3. What is this story mostly about?

a) A big brown dog lives next door to Bruce.
b) Every time Bruce comes near, Sparky barks.
x c) Bruce does not like to go near the big dog.

4. What is this story mostly about?

a) Bruce loves Sparky.
x b) Bruce does not like Sparky.
c) Bruce does not like to see Sparky.

5. How much does Sparky bark? (3)*

a) a little
x b) a lot
c) not too much

6. What is very loud? (5)

x a) Sparky's bark
b) Bruce's bark
c) Spot's bark

* Numbers in parentheses after questions indicate source sentence in passage.

7. What does Sparky do every time Bruce comes near? (4)

x a) barks
b) runs
c) sits

8. When does Sparky bark? (4)

a) every time a cat comes near
b) every time a dog comes near
x c) every time Bruce comes near

9. Where does Sparky live? (1)

x a) next door to Bruce
b) next door to Ben
c) down the street

10. Which dog lives next door to Bruce? (1)

a) a big black dog
x b) a big brown dog
c) a big white dog

11. Who does not like to go near the big dog? (6)

a) Sparky
x b) Bruce
c) Ben

Figure 4

Literal Comprehension Passage
and Items for Level 9

Mike works in the demolition business. He helps knock down old buildings so new ones can be built. Sometimes Mike drives a huge crane that swings a heavy ball. When the ball smashes against the wall of a building, the wall always crumbles.

Mike enjoys his work very much. He often thinks about his work. And he talks about it to anyone who will listen. Sometimes Mike says he has demolition in his blood. Sometimes his wife thinks he has demolition on the brain. When Mike drives home from work, he crashes his car into the garage wall. In his living-room, Mike trips and demolishes the coffee table.

1. The best title for this selection is

a) The Demolition Business
b) Against the Wall
x c) Demolition in His Blood
d) In the Living Room

2. The best title for this selection is

x a) Mike the Demolition Man
b) Crumbling Walls
c) Enjoying One's Work
d) The Car Crash

3. The main idea of this selection is

a) Mike helps knock down old buildings so new ones can be built.
b) The wall always crumbles.
x c) Mike enjoys his work very much.
d) Mike crashes his car into the garage wall.

4. The main idea of this selection is

a) The swinging ball always crumbles a wall.
x b) Mike is always demolishing things, on his job and at home.
c) In demolition something is wrong with the blood or the brain.
d) People who enjoy their work are always thinking about it.

5. How often does Mike drive a huge crane? (3)*

a) every day
b) seldom
x c) sometimes
d) never

6. What always crumbles? (4)

a) the crane
x b) the wall
c) the car
d) the coffee table

7. What does Mike do in his living room? (11)

a) works
b) thinks
c) talks
x d) trips

8. When does Mike crash his car into the garage wall? (10)

a) when he helps knock down old buildings
b) when he thinks about his work
c) when he enjoys his work
x d) when he drives home from work.

9. Where does Mike's wife sometimes think he has demolition? (9)

a) in his business
b) in his blood
x c) on the brain
d) in the living room

10. Which business does Mike work in? (1)

a) building
b) garage
x c) demolition
d) coffee

11. Who enjoys his work very much? (5)

a) Mack
x b) Mike
c) the driver
d) Mr. Crane

* Number in parentheses after question indicates source sentence in passage.

12. Why does Mike help knock down old buildings? (2)

a) because he drives a huge crane
b) so he can swing a heavy ball
x c) so new buildings can be built
d) because he has demolition on the brain